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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte DAVID J. CORISIS, WALTER L. MODEN,
and TERRY R. LEE

Appeal 2009-003529
Application 09/152,659
Technology Center 2800

Decided: December 10, 2009

Before CATHERINE Q. TIMM, MICHAEL P. COLAIANNI, and
JEFFREY B. ROBERTSON, *Administrative Patent Judges*.

TIMM, *Administrative Patent Judge*.

DECISION ON APPEAL

I. STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134 from the Examiner's decision rejecting claims 33-45 and 68-74. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

The Examiner relies upon the following evidence to reject the claims:

<u>First Named Inventor</u>	<u>Patent Number</u>	<u>Issue Date</u>
Edfors	US 5,050,039	Sep. 17, 1991
Chiu	US 5,239,199	Aug. 24, 1993
Cipolla	US 5,343,366	Aug. 30, 1994
Russell	US 5,432,678	Jul. 11, 1995
Shuff	US 5,812,374	Sep. 22, 1998
Jeffries	US 5,815,371	Sep. 29, 1998

The Examiner maintains, and Appellants seek review, of the following rejections:

1. Rejection of claims 33-38, 41, 42, and 68-73 under 35 U.S.C. § 103(a) as unpatentable over Chiu in view of Jeffries or Edfors or Russell.
2. Rejection of claims 39, 40, 43-45, and 74 under 35 U.S.C. § 103(a) as unpatentable over Chiu in view of Jeffries and further in view of Cipolla or alternatively in view of Shuff.

For the first rejection, we select claims 33, 68, and 71 as representative for deciding the issues on appeal in accordance with 37 C.F.R. § 41.37(c)(1)(vii).

For the second rejection, Appellants rely upon the arguments they advanced for claims 33 and 71 under the first rejection (Br. 13). Therefore, with regard to the second rejection, no further issue is presented for our review.

II. DISPOSITIVE ISSUES

Have Appellants established that the Examiner reversibly erred in:

- (1) finding a suggestion within the prior art to secure the heat sink/holding fixture 31 of Chiu so that the fixture 31 “is secured to [a contact] surface” as required by claim 33;
- (2) finding Chiu’s heat sink/holding fixture 31 is a “rail” that “extends along the sides of the plurality of integrated circuit pages” as required by claim 68; or
- (3) finding Chiu’s heat sink/holding fixture 31 is a “cross piece . . . extending over the plurality of integrated circuit pages in a direction transverse to the plurality of integrated circuit packages” as required by claim 71?

We answer in the negative.

III. FINDINGS OF FACT

The following Findings of Fact (FF) are particularly relevant for disposing of the issues on appeal:

Description of the Invention

1. Appellants' invention relates to supports for mounting integrated circuit packages, particularly, vertical surface mount packages (VSMPs) (Spec. 1:5-8). VSMP technology involves positioning the packages in an on-edge vertical alignment (Spec. 1:19-20).

2. A first embodiment of the support is shown in Figures 1 and 2, which are reproduced below:

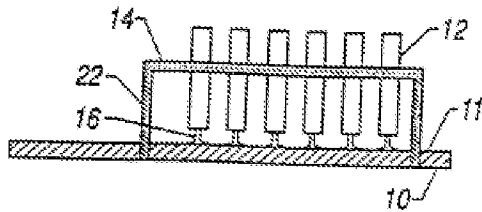


FIG. 1

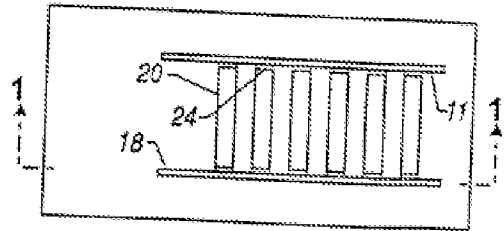


FIG. 2

Figure 1 is a cross-sectional view taken generally along line 1-1 in Fig. 2 (Spec 4:16-17).

Figure 2 is a top plan view of the embodiment of Fig. 1 (Spec. 4:18-19).

3. Figures 1 and 2 depict a support 14 including “a pair of parallel rails 18, shown in Fig. 2, which engage the opposed side edges 20 of each package 12.” (Spec. 5:14-16.)
4. A second embodiment of the support is shown in Figures 3 and 4, which are reproduced below:

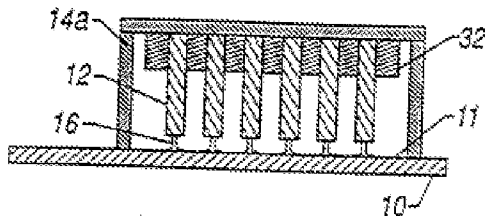


FIG. 3

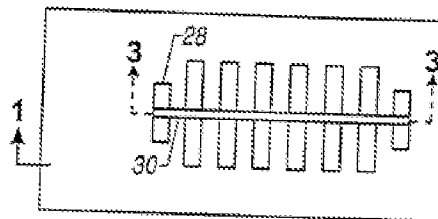


FIG. 4

Figure 3 is a vertical cross-sectional view of the second embodiment (Spec. 4:20-21).

Figure 4 is a top plan view of the second embodiment (Spec. 4:22-23).

5. Figures 3 and 4 depict a support 14a including “a pair of spaced lugs 28 (shown in Fig. 4) and a transverse cross piece 30 which engages the top edges of the package 12.” (Spec. 5:28-31.)
6. A third embodiment of the support is shown in Figures 5 and 6, which are reproduced below:

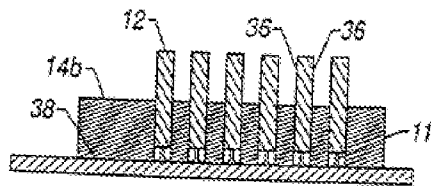


FIG. 5

Figure 5 is a vertical cross-sectional view of a third embodiment (Spec. 4:24-25).

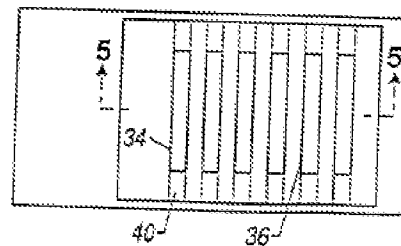


FIG. 6

Figure 6 is a top plan view of the third embodiment (Spec. 4:26-27).

7. Figures 5 and 6 depict a support 14b made of, for instance, a block of foam having a plurality of slits 34 within which the packages 12 may fit (Spec. 6:16-24). The foam block support 14b is slid over and down on the packages 12 (Spec. 6:22-24).

Claim 33

8. Claim 33 encompasses each of the three above described embodiments.
We reproduce claim 33 from the Claims Appendix of the Brief adding the relevant drawing reference numerals:
33. An electronic device, comprising:
a plurality of integrated circuit packages (12);

a contact surface (11) electrically connected (via contacts 16) to each of said packages (12); and

a support (14, 14a, 14b) arranged to engage each of said packages (12) at a point spaced above said surface (11) to prevent movement of said packages (12) relative to said surface (11), wherein said support (14, 14a, 14b) is secured to said surface.

(Claims App. at Br 15; Br. 3; FF 2-7.)

9. The Specification does not define “secure,” but uses this term in discussing the first and third embodiments. In regard to the first embodiment, upper surface 11 is said to secure the VSMPs 12 on the surface 11 “by way of a support 14.” (Spec. 5:6-8.) In regard to the third embodiment, the Specification speaks of adhesively securing the foam block support 14b to surface 11 (Spec. 6:32 to 7:2; *see also* Spec. 3:28-31).
10. The Specification also indicates that support 14, 14b “may pluggingly engage” or “may plug into” the PCB or card 10 (Spec. 5:14-17 and 6:1-2). The Specification also uses the word “connected” to describe the attachment between the support and the surface (Spec. 3:4-6; 4:8-9).
11. Claim 42 is dependent on claim 33 and further requires the support be “directly connected” to the surface (Claim 42).

Claim 68

12. Claim 68 reads as follows:

68. An electronic device, comprising:

a plurality of integrated circuit packages connected to a surface;
and

at least one rail coupled to the surface, wherein the rail extends
along the sides of the plurality of integrated circuit packages
and is configured to engage the plurality of integrated circuit
packages.

13. The Specification does not define “rail” (Spec., generally).

Claim 71

14. Claim 71 reads as follows:

71. An electronic device, comprising:

a plurality of integrated circuit packages connected to a surface;
and

a cross piece coupled to the surface and extending over the
plurality of integrated circuit packages in a direction transverse
to the plurality of integrated circuit packages.

15. The Specification does not define “cross piece” (Spec., *generally*).

Chiu

16. Chiu describes a heat sink/holding fixture (depicted at 31 in Fig. 6 and 31a in Figs. 8 and 10) used to hold vertically arrayed devices 10 during test and burn-in and then serve as a heat sink for the mounted array of devices (Chiu, col. 1, ll. 39-42; Figs. 6, 8, and 10). If faulty devices are detected during testing, they can be removed and replaced with good devices (Chiu,

col. 3, ll. 54-56). An array with good devices can then be placed on a circuit board and bonded by solder reflow to electrically connect the array to the circuit board (Chiu, col. 3, ll. 56-59).

17. Figure 10 of Chiu is reproduced below:

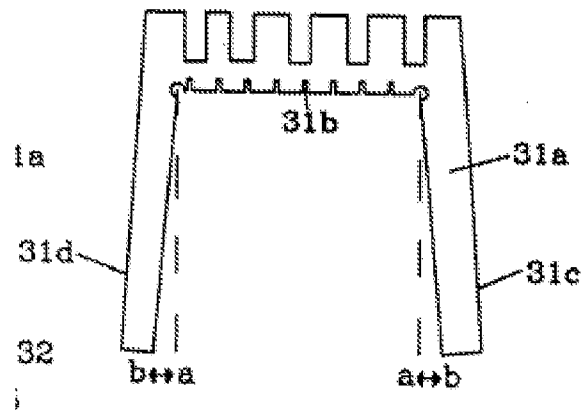


FIGURE 10

Figure 10 illustrates heat sink/holding fixture 31a.

18. As shown in Figure 10, the legs 31c and 31d of the fixture 31a are opened or moved apart from position “a” to position “b”. While the legs 31c and 31d are moved apart, devices are inserted into slots 31b. (Chiu, col. 3, ll. 22-30.) Figure 6 of Chiu shows portions 16 of devices 10 inserted into the slots (shown as slots 34). Figure 6 is reproduced below:

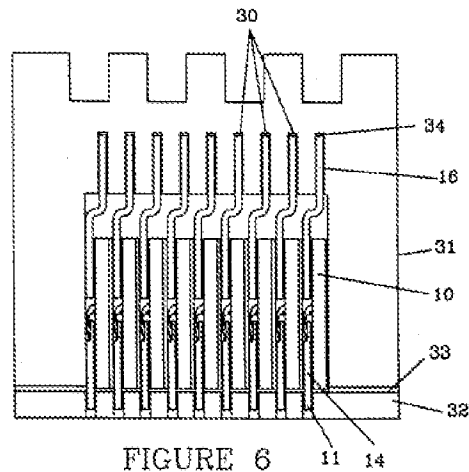


Figure 6 illustrates the heat sink/holding fixture 31 holding an array 30 of devices 10 (Chiu, col. 2, ll. 62-63; col. 3, ll. 49-50).

19. Figure 6 shows the other ends of the devices 10 (ends 11) inserted into a soldering mask 32 (Chiu, col. 2, ll. 53-56). The fixture 31 may be bonded to the soldering mask 32 (Chiu, col. 2, ll. 56-57).
20. Leads 14 of Chiu are connected to a circuit board 15 underlying the soldering mask 32 (Chiu, col. 3, ll. 10-21; Fig. 9).
21. The statement in Chiu that “[i]n the event the fixture 31 is not to remain over the device array, then [the] fixture 31 may be removed after the leads 14 are soldered to a circuit board” implies that the fixture may alternatively be left in place to remain over the device array (Chiu, col. 2, ll. 57-60).

Secondary Prior Art

22. The use of secured heat sinks around vertically mounted electrical devices on PCBs for heat dissipation during computer operation was known in the art (*See, e.g.*, Jeffries, heat dissipater 24 mounted at 32, 34 as shown in Fig. 2 (col. 3, ll. 52-53); Edfors, heat sink 30 adhesively mounted to board 14 as shown in Fig. 3 (col. 3, ll. 11-15)).

IV. PRINCIPLES OF LAW

“[A]s an initial matter, the PTO applies to the verbiage of the proposed claims the broadest reasonable meaning of the words in their ordinary usage as they would be understood by one of ordinary skill in the art, taking into account whatever enlightenment by way of definitions or otherwise that may be afforded by the written description contained in the applicant's specification.” *In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997). “[A]lthough the specification often describes very specific embodiments of the invention, we have repeatedly warned against confining the claims to those embodiments.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1323 (Fed. Cir. 2005)(en banc). Claim interpretation is a matter of law and will normally control the remainder of the decisional process. *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1567-68 (Fed. Cir. 1987).

A modification of the prior art would have been obvious under the law if "it is likely the product not of innovation but of ordinary skill and common sense." *KSR Int'l v. Teleflex Inc.*, 550 U.S. 398, 421 (2007). While “it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does,” *Id.* at 418, “the analysis need not seek out precise teachings [in the prior art] directed to the specific subject matter of the challenged claim” *Id.* “[T]he question in a section 103 case is not only what the references expressly teach, but what they would collectively suggest to one of ordinary skill in the art.” *In re Simon*, 461 F.2d 1387, 1390 (CCPA 1972).

When the prior art teaches away from a combination, that combination is more likely to be nonobvious, *KSR*, 550 U.S. 398, 417, but to teach away, a

reference must discourage one of ordinary skill in the art from following the path set out in the reference, or lead that person in a direction divergent from the path that was taken by the applicant, *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994), or teach away from a use that would render the result inoperable. *McGinley v. Franklin Sports, Inc.*, 262 F.3d 1339, 1354 (Fed. Cir. 2001).

“Although a reference that teaches away is a significant factor to be considered in determining unobviousness, the nature of the teaching is highly relevant, and must be weighed in substance.” *Gurley*, 27 F.3d at 553.

The amount of redesign and reconstruction required to adopt the modification as well as changes in the basic principles of operation are also relevant, and must be weighed in determining unobviousness. *In re Ratti*, 270 F.2d 810, 813 (CCPA 1959).

V. ANALYSIS

Claim 33

Appellants note that “[i]n rejecting independent claims 33, 68, and 71, the Examiner stated that Chiu ‘disclosed the claimed invention except the support being secured to the surface.’” (Br. 8, citing Final Office Action 3.) As further noted by Appellants, the Examiner relied upon Jeffries, or in the alternative, Edfors or Russell as evidence supporting a finding of a suggestion to secure the support of Chiu to the surface (Br. 8). Appellants contend that the combination of Chiu with the secondary references is unsupported by the cited prior art because 1) Chiu teaches away from the combination, 2) there is no “rational underpinning” to support the conclusion, and 3) the proposed modification makes the device of Chiu unsatisfactory for its intended purpose (Br. 9).

As a first matter, we note that “secured” is only recited in claim 33. Therefore, we select claim 33 as representative to resolve the issue.

As a second matter, we note that “secured” is not defined in the Specification, and, in fact, is used consistently with a broad meaning encompassing any direct or indirect connection or attachment (FF 9-11). That the word “secured” encompasses connecting indirectly is evidenced by claim 42, a claim dependent on claim 33 that requires direct connection. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1314-15 (Fed. Cir. 2005) (“the presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim.”).

Chiu suggests securing leads 14 of the devices 10 to the surface of a circuit board (i.e., a contact surface) (FF 20). Chiu further suggests to one of ordinary skill in the art leaving the fixture 31, 31a in place as a heat sink for the mounted array (FF 16 and 21). As such, Chiu’s support (heat sink/holding fixture 31, 31a) is indirectly secured or connected to the contact surface (i.e., the circuit board surface) by way of the leads 14. As claim 33 encompasses Chiu’s device with a support (fixture 31, 31a) secured to a contact surface (circuit board 15) through leads 14, we cannot say that the Examiner reversibly erred in concluding that the prior art provides evidence of obviousness within the meaning of 35 U.S.C. § 103(a).

Moreover, we cannot agree with Appellants that the references either teach away from securing or that securing would render Chiu’s device unsatisfactory for its intended purpose (Br. 8-13). Chiu suggests soldering the leads 14 to the circuit board after testing and further bonding the heat sink/holding fixture 31, 31a to the soldering mask (FF 16, 19). This would

permanently secure the entire assembly together with the fixture 31. In addition, Chiu as well as the secondary references provide evidence that a heat sink was recognized as useful for dissipating heat in the ultimate use of such an assembly within a computer (FF 16 and 22). The evidence weighs in favor of the findings and conclusions of the Examiner.

Appellants have not established that the Examiner reversibly erred in finding a suggestion within the prior art to secure the heat sink/holding fixture 31 of Chiu so that the fixture 31 “is secured to [a contact] surface” as required by claim 33.

Claim 68

Claim 68 requires “at least one rail coupled to the surface, wherein the rail extends along the sides of the plurality of integrated circuit packages.” The Examiner finds that heat sink/holding fixture 31 of Chiu is a “rail” within the meaning of claim 68 that extends “along the sides” as claimed because fixture 31 extends along the top sides of the devices 10 of Chiu (Ans. 4 and 6).

Appellants contend that, in light of their Specification and the plain meaning of “rail” and “sides,” the heat sink/holding fixture 31 of Chiu is clearly different than a rail. Appellants cite the portion of their Specification disclosing that the rails “engage the opposed side edges 20 of each package 12.” (Br. 6-7; Reply Br. 3-4.)

As a first matter, Appellants introduce no evidence establishing that a “rail” would be understood as a different structure from the overhead portion of Chiu’s fixture 31. A “rail” is “a bar of wood or metal fixed horizontally for any of various purposes, as for a support, barrier, fence, or railing” (The Random House Dictionary of the English Language, 1187 (unabridged ed., 1966); *see*

also Dictionary.com). Appellants do not define “rail” in their Specification to have a meaning different from its plain meaning, and the use of the term in the Specification is consistent with the dictionary definition (FF 3). It is reasonable to interpret “rail” as used in claim 68 to encompass the horizontal portion of Chiu’s fixture 31. Chiu’s fixture 31 serves as a support.

As a second matter, claim 68 does not include the language “engage the *opposed side edges*” as recited in the Specification (FF 3). The claim merely requires a rail extend “along the *sides* of the plurality of integrated circuit packages” (emphasis added). While the packages have opposed sides (or side edges), they also have top and bottom sides (or side edges). It was reasonable to the Examiner to interpret claim 68 as encompassing a single rail extending along the *top* sides (or top side edges) of the plurality of packages as disclosed by Chiu. This is so especially in light of the imprecision of the claim language as compared to the Specification (sides versus side edges).

Appellants have not established that the Examiner reversibly erred in finding Chiu’s heat sink/holding fixture 31 is a “rail” that “extends along the sides of the plurality of integrated circuit pages” as required by claim 68.

Claim 71

Claim 71 requires “a cross piece coupled to the surface and extending over the plurality of integrated circuit packages in a direction transverse to the plurality of integrated circuit packages” (FF 14). The Examiner finds that the upper part of Chiu’s fixture 31 meets the requirements of the claimed cross piece (Ans. 4). Appellants contend that fixture 31 is not a “cross piece” that extends “in a direction transverse” as claimed (Br. 7-8; Reply Br. 4-5).

Appellants provide no definition for “cross piece” that would distinguish the claimed “cross piece” from the upper part of Chiu’s fixture 31 (Br. 7-8; Reply Br. 4). Nor does the Specification provide such a definition (FF 15). We determine that claim 71 encompasses the embodiment of the invention Appellants depict in Figures 3 and 4 (compare FF 4-5 with FF 14). Just as in Appellants’ embodiment depicted in Figures 3 and 4, the upper part of Chiu’s fixture 31 extends across the top of the packages 10 and in a direction transverse to those packages. Given the similarities between the cross piece 30 depicted in Appellants’ Figures 3-4 and the fixture 31 depicted in Chiu (FF 17 and 19), the Examiner’s finding is reasonable.

Appellants have not established that the Examiner reversibly erred in finding Chiu’s heat sink/holding fixture 31 is a “cross piece . . . extending over the plurality of integrated circuit pages in a direction transverse to the plurality of integrated circuit packages” as required by claim 71.

VI. CONCLUSION

As Appellants have not shown reversible error in the Examiner’s obviousness rejections, we sustain the rejections.

VII. DECISION

The decision of the Examiner is affirmed.

VIII. TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

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